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Cover photo: Male *Poecilognathus fuscomarginatus* sp nov. from Arizona. Photo: Lisha Jesper.

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A remarkable new species of the *Poecilognathus punctipennis* group from Arizona (Diptera: Bombyliidae)

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Abstract. A new species of the *Poecilognathus punctipennis* group from the Southwestern U.S. and northern Mexico, *Poecilognathus fuscomarginatus*, n. sp. is described and illustrated. It is most similar to the Floridian *Poecilognathus punctipennis* (Walker), but differs in the coloration pattern of the wings and head features. A revised key to the species of the *Poecilognathus punctipennis* group in the Nearctic is given.

INTRODUCTION

Material belonging to a new species of *Poecilognathus* Jaennicke with distinctive wing patterning has been found in Arizona and New Mexico in the United States and Sonora in Mexico and is described below. Distribution is augmented with links to observations deriving from social media.

MATERIAL AND METHODS

Material examined during this study derives from or are deposited in the following collections: AMNH (American Museum of Natural history, New York, New York, USA); BPBM (Bernice Pauahi Bishop Museum, Honolulu, Hawai'i, USA); CAS (California Academy of Sciences, San Francisco, California, USA); SDNHM (San Diego Natural History Museum, San Diego, California, USA); UCB (University of California, Berkeley, California, USA); UCR (University of California, Riverside, California, USA); USNM (National Museum of Natural History, Washington, DC, USA); USU (Utah State University, Logan, Utah, USA). General morphological terminology follows Cumming & Wood (2017).

Dissection of various body parts for examination were accomplished by heating structures in 10% acetic acid to stop the clearing process, washed in distilled H_2O, and transferred to a glycerin solution for dissection. Prepared structures are associated with pinned specimens either via slide mounts or structures placed in glycerin in a small microvial vial pinned below the specimen.

Photographic images were accomplished by obtaining a series of stacked images using a Leica M165C stereo dissecting scope via the Leica Microsystems LAS Multifocus software (v. 5.1.0.2) and using Zerene Stacker® stacked focusing software (v. 1.04) (Zerene Systems, LLC, Richmond, Washington, USA) to align and stack-focus each final image.

Figure 1. *Poecilognathus fuscomarginatus*, sp. nov. Male habitus, lateral.

TAXONOMY

Genus *Poecilognathus* Jaennicke

Poecilognathus Jaennicke, 1867: 350. Type species: *Poecilognathus thlipsomyzoides* Jaennicke, 1867, by monotypy.

Geronites Cockerell, 1914: 230. Type species: *Geronites stigmalis* Cockerell, 1914 [= *Phthiria sulphurea* Loew, 1863], by monotypy.

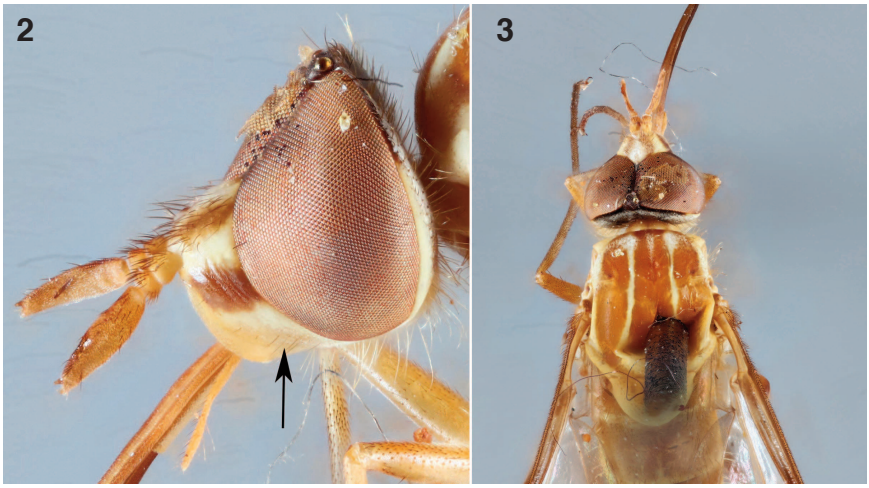
Agenosia Hull, 1973: 195 (as subgenus of *Phthiria*). Type species: *Phthiria vittata* Hull, 1973 [= *Phthiria loewi* Painter *in* Painter & Painter, 1965], by original designation.

Key to Nearctic Species of *Poecilognathus punctipennis* Jaennicke group
[modified from Evenhuis (2024)]

1. Wing with spots ... (*Poecilognathus punctipennis* group) **2**
–. Wing without spots, some yellow to brown color may be present in cell sc .... (*Poecilognathus loewi* group)

2. Face with distinct black to brown spots or markings, never entirely yellow; halter knob orange to black, rarely all yellow **3**
–. Face all yellow, no distinctly contrasting black to brown markings or spots, if spots exist, they are indistinct and pale in color; halter knob entirely yellow .... *sulphureus* (Loew)

3. Face with single dark brown to black spot laterally below antenna on gena (clear area maybe present on lower face that looks darker than surrounding color, but is not a black marking) **4**



Figures 2–3. *Poecilognathus fuscomarginatus*, sp. nov. **2**. Male head, lateral view. Arrow points to clear area on face. **3**. Male head and thorax, dorsal view.

–. Face all black, black with small lateral yellow spot, or face with at least two brown to black markings laterally below antenna on gena **8**

4. Maxillary palpus dark brown to black **5**
–. Maxillary palpus yellow, orange, or light brown (if brownish, then no infuscation along wing margin) ... (Arizona) ..... *damfino* Evenhuis

5. Halter knob yellow to orange, no dark brown to black color present (see also couplet 8) ..... *badius* (Coquillett), in part
–. Halter knob predominantly dark brown dorsally, yellow, if present, restricted to ventral and/or apical portions **6**

6. Hind margin of wing without spots at apices of veins ..... *unimaculatus* (Coquillett)
–. Hind margin of wing with brown spots at apices of veins and/or infuscation coalesced along posterior wing margin **7**

7. Hind margin of wing with infuscation coalesced into a distinct broad band (Fig. 6A); abdominal tergites orange (some brown medially) with paler posterior margins; hind legs brown; antennae yellowish brown; clear area laterally on tergites II large .. (Arizona, New Mexico, Sonora) ..... ***fuscomarginatus***, **n**. **sp**.
–. Hind margin of wing brown spots at apices of veins but without coalesced infuscation (Fig. 6B); abdominal tergites black with contrasting yellow posterior margins; hind leg black; antennae dark brown to black; clear area laterally on tergite II reduced to a spot ... (Florida, Georgia) ..... *punctipennis* (Walker)

8. Male **9**
–. Female **11**

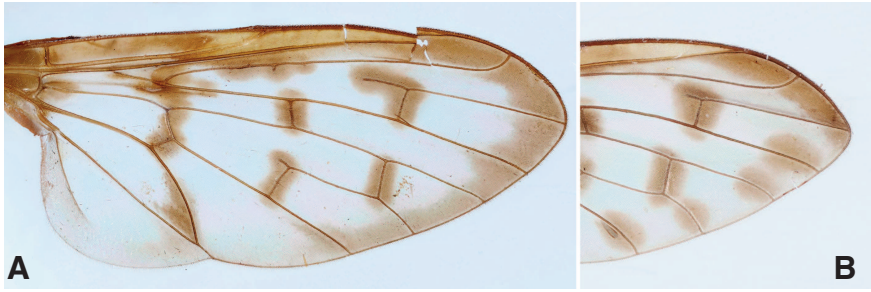


Figure 4. Wings of *Poecilognathus*. **A**. *Poecilognathus fuscomarginatus*, sp. nov. **B**. Apex of wing of *P. punctipennis* Coquillett.

9. Mesonotum dark reddish brown to black, with or without vittae; humeral callus yellow; halter knob orange; hind femur yellow (see also couplet 5) .... *badius* (Coquillett)

–. Mesonotum variable in color; humeral callus yellow or gray to black; halter knob with some black; hind femur brown to black, rarely yellow **10**

10. Scutellum creamy white to yellow laterally and posteriorly, without tan or brown color on those areas; notopleural stripe of yellow to white color, contrasting sharply with darker color of mesonotum, extending forward from scutellum to at least supra alar area, often to humeral callus; halter knob color variable, often all black … (central Mexico) ..... *thlipsomyzoides* Jaennicke

–. Scutellum tan laterally and posteriorly, yellow to white color, if present, restricted to medial stripe; notopleural stripe not evident, if present, then not contrasting sharply with color of mesonotum, usually paler brown than mesonotum; halter knob with yellow spot at apex … (midwestern and southwestern United States; Hidalgo) ..... *scolopax* (Osten Sacken)

11. Mesonotum brown with contrasting spot of black above each humeral callus; lower portion of gena produced forward so as to extend further than upper gena … (central Mexico) ... *thlipsomyzoides* Jaennicke

–. Mesonotum without such spots; lower gena receding, upper gena produced further forward than lower portion ... (United States and northern Mexican states) .... *scolopax* (Osten Sacken)

***Poecilognathus fuscomarginatus* Evenhuis , sp. nov.**
(Figs. 1–6)

Types. *Holotype* ♂ and 1♀ *paratype* from UNITED STATES: **Arizona**: Cochise County: Southwest Research Station, 30 Aug 1967, E.I. Schlinger (UCR). *Other paratypes*: UNITED STATES: **Arizona**: Cochise County: 1♂, 1♀, Southwest Research Station, 18 Aug 1959, H.E. Evans (USNM); 1♂, same data except 23 Aug 1959 (USNM); 3♂, Huachuca Mts, Miller Canyon, 2 Sep 1968, W.J. Hanson (USU); 1♀, same data except 12 Aug 1961 [no further data] (USU); 1♂, 1♀, same locality but no date or collector (USNM); 1♀, Stewart Camp, 1 mi [1.2 km] W Portal, 12–15 Aug 1971, J. Doyen (UCB); 1♀, Douglas, 7 Aug 1980, D.K. Faulkner (SDNHM); 1♀, same data except 18–19 Jul 1973, on *Larrea tridentata*, 800–830am, E.G. & E.M. Linley (UCB). Pima County: 1♀, Baboquivari

Mountains, 20 Aug 1924, O.G. Poling (UCB). Santa Cruz County: 1♀, Nogales, 1Sep 1949, R.H. Crandall (AMNH); 1♀, Sycamore Canyon, Ruby Road, 9 Sep 1979, Knowlton & Hanson (USU); 1♂, Sycamore Canyon near Ruby, 16 Aug 1961, W. Nutting (USNM). **New Mexico**: Hidalgo County: 1♂, Skeleton Canyon, 14 Aug 1965, G. Forister (UCR). MEXICO: **Sonora**: 3♀, 6 mi [9.6 km] N. Cananea, 6,000 ft [1,829 m], 15 Aug 1959, W.L. Nutting, F.G. Werner (USNM). Holotype in UCR.

Non-types deriving from social media.
United States:
Miller Canyon, Huachuca Mountains, Cochise County, Arizona
https://bugguide.net/node/view/313842/bgimage

Fort Huachuca, Cochise County, Arizona
https://bugguide.net/node/view/371474/bgimage

Florida Canyon, Pima County, Arizona
https://bugguide.net/node/view/694356/bgimage

Hereford, W of Hwy. 92, lower Ash Canyon, Cochise County, Arizona
https://bugguide.net/node/view/1590316/bgimage

Lower Florida Canyon, Pima County, Arizona
https://bugguide.net/node/view/1720796/bgimage

Florida Canyon, Santa Rita Mountains, Pima County, Arizona
https://bugguide.net/node/view/994196/bgimage

Cochise County, Arizona [31.88386, -109.20594]
https://www.inaturalist.org/observations/179865220

Martin Luther King Jr Pkwy, Sierra Vista, Arizona
https://www.inaturalist.org/observations/185067726

Sierra Vista, Arizona
https://www.inaturalist.org/observations/183900599

Oro Valley, Arizona
https://www.inaturalist.org/observations/235482266

Mexico:
Municipio de Nogales, Sonora
https://www.inaturalist.org/observations/58130985

Diagnosis: Most similar in appearance to *Poecilognathus punctipennis* (Walker) based on both species having spots of infuscation at the apices of the wing veins. It can easily be separated from *P. punctipennis* by the coalesced infuscation along the posterior margin of the wing (with separate spots in *P. punctipennis*); the brown hind legs (black in *P. punctipennis*); and the yellowish brown antennae (dark brown to black in *P. punctipennis*).

Description
Lengths: Body: 6.7–7.0 mm; wing: 5.8–7.0 mm. **Male** (Fig. 1). *Head:* Ocellar tubercle triangular, blackish gray tomentose. Eyes holoptic. Occiput with upper half black, gray pollinose with short white hairs, lower half yellowish white; mentum yellowish white,

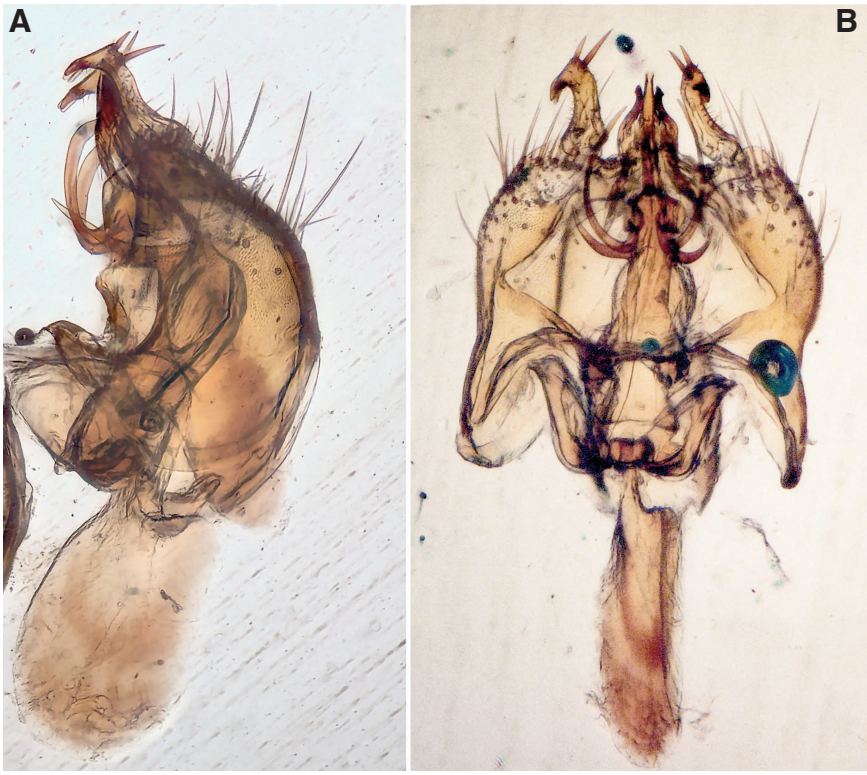


Figure 5. *Poecilognathus fuscomarginatus*, sp. nov. Male genitalia. **A**. Lateral view. **B**. Ventral view.

with scattered white hairs. Antennae with scape yellow, pedicel yellowish brown, subcylindrical, with erect black setae dorsally and laterally; flagellum yellowish brown, 6× length of pedicel, linear, with short stiff hairs dorsally; style in apical indentation of flagellum, apex of flagellomere with dorsal prong brown, shorter than yellowish brown ventral prong. Frons small, elongate-triangular, bare, yellow with brown admedian vittae bearing fine brown hairs; face yellow, with broad black band laterally below antenna, clear area on lower face (Fig. 2). Palpus yellow to orange. Proboscis orange-brown, length about 4× head height.

Thorax (Fig. 3): Mesonotum and scutellum matte brownish orange, with yellow on following: narrow admedian mesonotal dorsal stripes, humeral callus, notopleural stripe, and postalar callus; mesonotum with uniformly scattered fine short white hairs; mesonotal admedian vittae extending from humeral area onto scutellum, coalescing with yellowish white posterior border; scutellum with small brown triangle basomedially. Pleura yellow with brown on anepisternum, dark brown anteroventral portion of katepisternum, and anterior half of anepimeron; metepisternum yellowish white; katatergite white. Halter stem yellow, knob brown.

Figure 6. *Poecilognathus fuscomarginatus*, sp. nov. Female genitalia. **A**. Genital fork, basal duct and sperm pump. **B**. Spermatheca and apical duct (not to same scale as 6A).

Wing (Fig. 4): Subhyaline with brown infuscation in cell sc along costa, brown band extending along costal rim to M_4 (paler infuscation continuing from there along edge of wing to alula), smoky dark brown infuscation on following: junction of Rs and R_{2+3} which forms a narrow band from there to posterior crossvein (m-cu) ; large spot at middle of R_{2+3} (this area with minute spur veins in some specimens), base of R_{4+5} including spur vein; crossvein r-m; vein at base of cell dm; crossvein m-cu; crossvein m-m; origin of vein M_3 off of M_4 including its spur vein, ands large spot at apex of anal cell; anal cell closed well before wing margin.

Legs: Fore coxa yellow; mid and hind coxa yellowish brown; fore and mid femora and tibiae yellow; hind femur yellowish brown, hind tibia yellow; tarsi brown; pulvilli well developed, ellipsoid, almost equal to length of claws.

Abdomen: Linear-conical, tapering to apex; tergite I thin, yellow, with fine white hairs; tergite II yellow medially, clear area laterally and lateroventrally, with very short white hairs basomedially, black posteriorly; succeeding tergites yellow with darker medial areas and at extreme lateral edge, with scattered short black hairs dorsally (NB: holotype has apical tergites discolored black); sternites patterned as tergites, except sternite III clear laterally, all with black hairs.

Male genitalia (Fig. 5): Hypopygium yellowish brown, black basally; gonocoxites subovoid in lateral view, setae restricted to upper half, bare below; gonostylus long, thin, with right-angled apex, apex bearing two thick peg-like spines (having the appearance of a horned cervid); parameral sheath with thin strongly curved (in lateral view) paired sharply pointed processes, darkly sclerotized; in ventral view with penial guide unremarkable, not bearing spines; aedeagus [distiphallus] long thin, strongly curved in lateral view; aedeagal apodeme subquadrate with rounded edges, with strongly sinuous (in ventral view) foliate lateral rami.

Female. As in male except as follows: eyes dichoptic, separated at vertex by 3× with of ocellar tubercle; frons yellow with broad orange-brown medial stripe on upper half, triangular mark on lower half to level of antennae, medially on upper portion with elongate gray tomentose spot; upper occiput yellow; hind legs generally paler; abdominal tergites and sternites without clear areas laterally. *Female genitalia* (Fig. 6) with genital fork parentheses-shaped, not connected above or below, but with medial T-shaped sclerite associated with vaginal opening; spermathecae digitiform, sclerotized dark brown to black, with typical clear swollen area subbasally, spermathecal base and its attachment to apical duct sclerotized brown; apical duct (broken off from sperm pump during dissection) thin, length subequal to spermatheca, sclerotized apically, translucent basally, with trichomes at connection to spermatheca; sperm pump dumbbell-shaped with apical and basal valves sclerotized brown; basal duct thick, clear, slightly longer than spermatheca, fused into very short common duct near vaginal opening.

Variation. The coloration of the abdominal terga vary from yellowish to brown, both with dark brown markings dorsomedially. The hind femora also can vary from yellow to brown.

Remarks. The only other species that *Poecilognathus fuscomarginatus* might be confused with in Arizona is *P. unimaculatus* (Coquillett), which is similar in body coloration. However, it is easily separated from *P. unimaculatus* by the dark band along the wing margin (this band lacking in *P. unimaculatus*).

Distribution: USA (Arizona, New Mexico); Mexico (Sonora).

ACKNOWLEDGMENTS

Thanks to Robert Behrstock for prompting me to look at this species again by sending me photos from a species from Arizona he had tried to key out. It had been sorted out many years ago in my review of Nearctic *Poecilognathus* but not yet published. Thanks also to Lisha Jesper for taking images of the adult.

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